

CLAIMS:

1. A system for selecting and controlling electromechanical valves, the system comprising:

5 an internal combustion engine having a first and second group of cylinders, said first group of cylinders having valves operating in a first pattern and said second group of cylinders having valves operating in a second pattern, said cylinders in said first and second
10 group each having a cylinder head with at least four regions, with each region having an electromechanical valve; and

 a controller to select at least an intake valve for each cylinder of said first cylinder group, located
15 in at least one region of said first and second region, and to select at least a different intake valve for each cylinder of said second cylinder group, located in at least one region of a first and second region, and to select at least an exhaust valve for said first cylinder
20 group located in at least one region of said third and fourth region, and to select at least a different exhaust valve for said second cylinder group located in at least one region of a third and fourth region, and to operate at least one cylinder from each of said selected first
25 and second cylinder group with said selected intake and exhaust valves, without operating non-selected valves, during a respective cycle of said cylinder group.

2. The system of Claim 1 wherein said first cylinder
30 group selected intake valve and said first cylinder group selected exhaust valve lie in regions having adjacent sides, and wherein said second cylinder group selected intake valve and said second cylinder group selected exhaust valve lie in regions having adjacent sides.

3. The system of Claim 1 wherein said first cylinder group selected intake valve and said first cylinder group selected exhaust valve lie in regions having nonadjacent
5 sides, and wherein said second cylinder group selected intake valve and said second cylinder group selected exhaust valve lie in regions having nonadjacent sides.
4. The system of Claim 1 wherein said first cylinder
10 group selected intake valve and said first cylinder group selected exhaust valve lie in regions having adjacent sides, and wherein said second cylinder group selected intake valve and said second cylinder group selected exhaust valve lie in regions having nonadjacent sides
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5. The system of Claim 1 wherein said first and second cylinder groups are located in different banks of a V engine.
- 20 6. The system of Claim 1 wherein said first and second cylinder groups combust mixtures having different air-fuel ratios.
7. The system of Claim 1 wherein said first and second
25 cylinder groups have different spark timing.
8. The system of Claim 1 wherein said first and second cylinder groups induct different engine air amounts.
- 30 9. The system of Claim 1 wherein said first and second cylinder groups have different valve lift heights.
10. The system of Claim 1 wherein said first and second cylinder groups have different valve timing.

11. The system of Claim 1 wherein said intake valves located in said region one and two are different diameters.

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12. A system for selecting and controlling electromechanical valves, the system comprising:

an internal combustion engine having a first and second group of cylinders, said first group of
10 cylinders having valves operating in a first pattern and said second group of cylinders having valves operating in a second pattern, said cylinders in said first and second group each having a cylinder head with at least four regions, with each region having an electromechanical
15 valve; and

a controller to select at least an intake valve for each cylinder of said first cylinder group, located in at least one region of said first and second region, and to select at least a different intake valve for each
20 cylinder of said second cylinder group, located in at least one region of a first and second region, and to operate said selected intake valve in each cylinder of said first cylinder group, without operating non-selected intake valve in each cylinder of said first cylinder
25 group during a cycle of said cylinder in said first cylinder group, and to operate said non-selected intake valve in each cylinder of said first cylinder group during a subsequent cycle of each cylinder of said first cylinder group, without operating selected intake valve
30 in each cylinder of said first cylinder group during a cycle of said cylinder in said first cylinder group, and to operate said selected intake valve in each cylinder of said second cylinder group, without operating non-selected intake valve in each cylinder of said second

cylinder group during a cycle of said cylinder in said second cylinder group, and to operate said non-selected intake valve in each cylinder of said second cylinder group during a subsequent cycle of each cylinder of said second cylinder group, without operating selected intake valve in each cylinder of said second cylinder group during a cycle of said cylinder in said second cylinder group, to select at least an exhaust valve for each cylinder of said first cylinder group, located in at least one region of said third and forth region, and to select at least a different exhaust valve for each cylinder of said second cylinder group, located in at least one region of a third and forth region, and to operate said selected exhaust valve in each cylinder of said first cylinder group, without operating non-selected exhaust valve in each cylinder of said first cylinder group during a cycle of said cylinder in said first cylinder group, and to operate said non-selected exhaust valve in each cylinder of said first cylinder group during a subsequent cycle of each cylinder of said first cylinder group, without operating selected exhaust valve in each cylinder of said first cylinder group during a cycle of said cylinder in said first cylinder group, and to operate said selected exhaust valve in each cylinder of said second cylinder group, without operating non-selected exhaust valve in each cylinder of said second cylinder group during a cycle of said cylinder in said second cylinder group.

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13. The method of claim 12 wherein said first cylinder group selected intake valve and said first cylinder group selected exhaust valve lie in regions having adjacent sides, and wherein said second cylinder group selected
5 intake valve and said second cylinder group selected exhaust valve lie in regions having adjacent sides.

14. The method of claim 12 wherein said first cylinder group selected intake valve and said first cylinder group
10 selected exhaust valve lie in regions having nonadjacent sides, and wherein said second cylinder group selected intake valve and said second cylinder group selected exhaust valve lie in regions having nonadjacent sides.

15 15. The method of claim 12 wherein said first cylinder group selected intake valve and said first cylinder group selected exhaust valve lie in regions having adjacent sides, and wherein said second cylinder group selected intake valve and said second cylinder group selected
20 exhaust valve lie in regions having nonadjacent sides.

16. The system of Claim 12 wherein said first group of cylinders include odd numbered cylinders and wherein said second group of cylinders includes even numbered
25 cylinders.

17. The method of Claim 12 wherein said first and second cylinder groups combust mixtures having different air-fuel ratios.

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18. The method of Claim 12 wherein said first and second cylinder groups have different spark timing.

19. The method of Claim 12 wherein said first and second cylinder groups induct different engine air amounts.
20. The method of Claim 12 wherein said first and second
5 cylinder groups have different valve lift heights.
21. The method of Claim 12 wherein said first and second cylinder groups have different valve timing.
- 10 22. The system of Claim 12 wherein said intake valves located in said region one and two are different diameters.
23. A computer readable storage medium having stored
15 data representing instructions executable by a computer to control an internal combustion engine of a vehicle, said storage medium comprising:
- instructions to select at least an intake valve for each cylinder of said first cylinder group, located
20 in at least one region of said first and second region, and to select at least a different intake valve for each cylinder of said second cylinder group, located in at least one region of a first and second region, and to select at least an exhaust valve for said first cylinder
25 group located in at least one region of said third and fourth region, and to select at least a different exhaust valve for said second cylinder group located in at least one region of a third and fourth region, and to operate at least one cylinder from each of said selected first
30 and second cylinder group with said selected intake and exhaust valves, without operating non-selected valves, during a respective cycle of said cylinder group.